

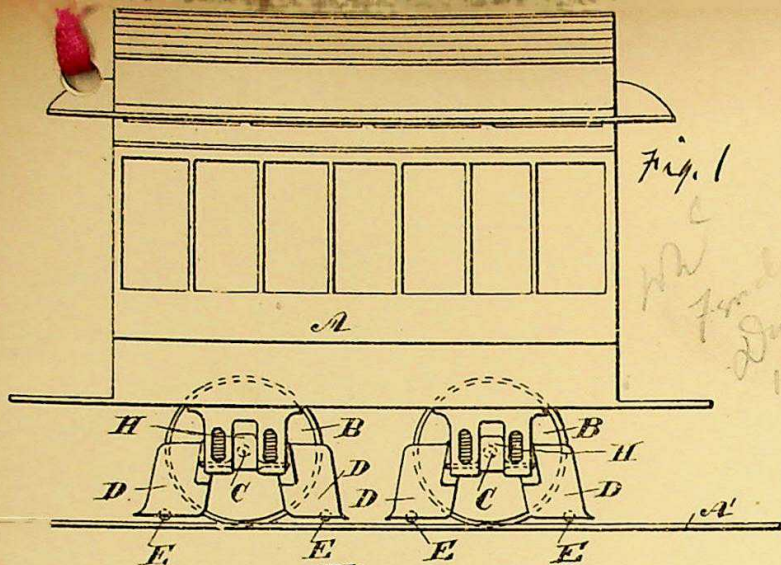


Fig. 1

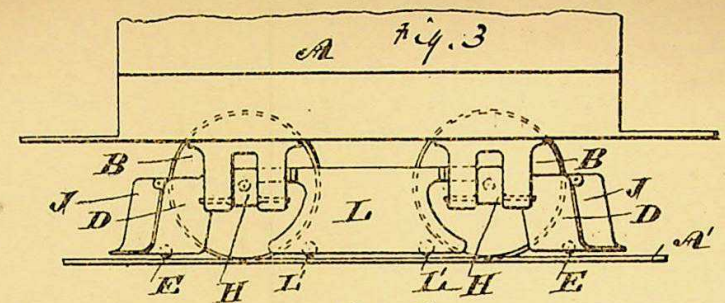


Fig. 3

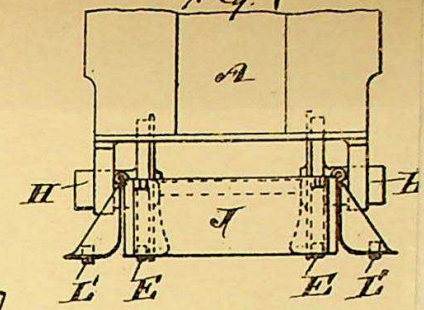


Fig. 4

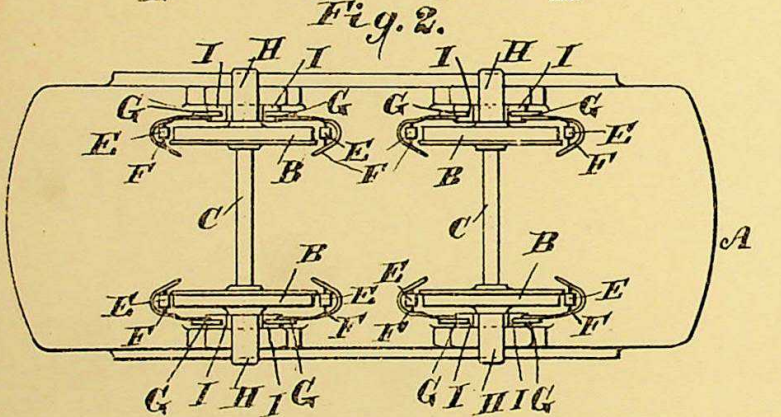


Fig. 2

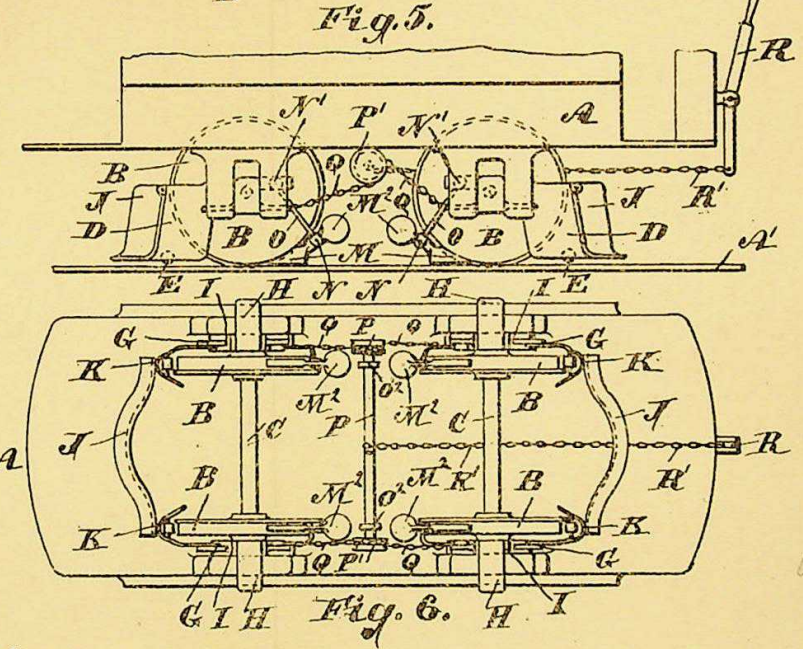


Fig. 5

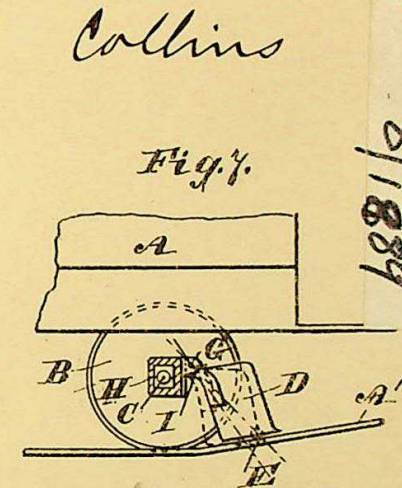


Fig. 7

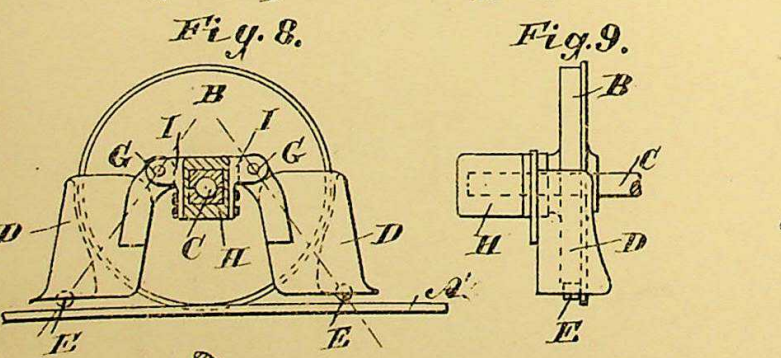


Fig. 8

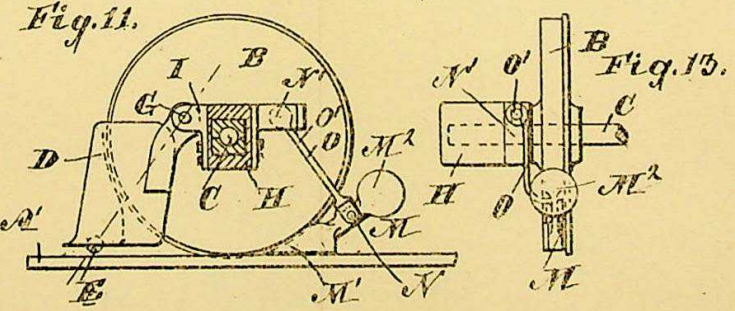


Fig. 11

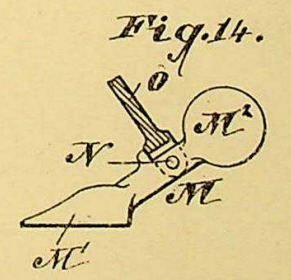


Fig. 14

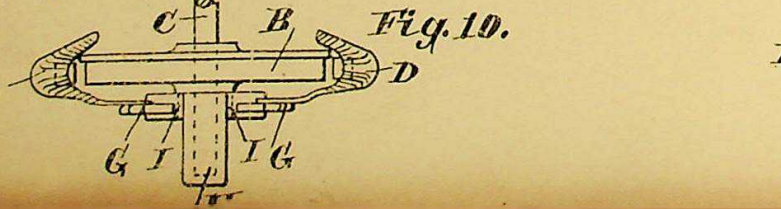


Fig. 10

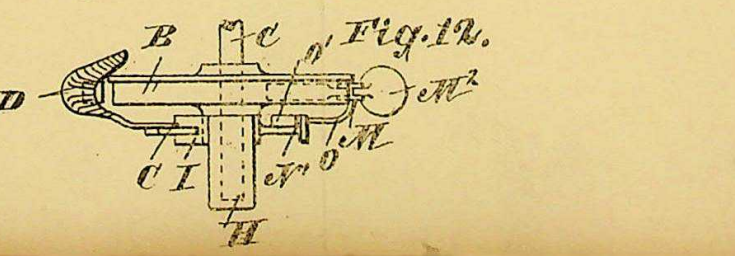


Fig. 12

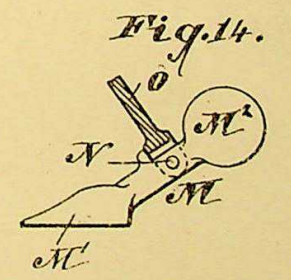


Fig. 13

Collins

Wheel fenders
Dw IV

8/1889

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N° 13,602



A.D. 1889

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Date of Application, 29th Aug., 1889
Complete Specification Left, 22nd Mar., 1890—Accepted, 26th Apr., 1890

PROVISIONAL SPECIFICATION.

An Improved Wheel Guard Applicable for use on Tramcars, Railway Carriages, and other Vehicles.

I, JOHN MOUNTGOMERY COLLINS, of 45 Bartholomew Street, Bridgeton, Glasgow, Engineer, do hereby declare the nature of this invention to be as follows :—

In the majority of vehicles as presently constructed, no provision whatever is made for preventing pedestrians and others, who may happen to be knocked down by the vehicle, from being run over by the wheels. In some vehicles, however, very crude and inefficient wheel guarding appliances are provided.

This invention has for its object the providing of an efficient wheel guard for tramcars, railway carriages and other vehicles, which will prevent, or aid in the prevention, of the, at present, too numerous fatalities arising from persons being run over by passing vehicles.

My improved wheel guard, which, for the sake of illustration I will describe as being fitted to a tramcar, consists of a, preferably, metal shield which is shaped somewhat after the manner of the mould-board of a plough. This shield has its sharp part or edge a little in front of the wheel of the car and the two sides extend backwards for a distance sufficient to enclose the front part of the wheel. Inside the guard or shield at its lower part, pretty well forward, is fitted a small broad wheel the periphery of which projects a little underneath the lower edges of the guard or shield. This wheel is or may be loosely fitted on a stud or pin passed through the guard from side to side.

The wheel guard is at its upper end so pivotted to the car at a point perpendicularly or nearly so above the axle of the car wheel that, on the slightest inequality of the rail, or on the small wheel over-riding any small obstruction, or in the event of any extra pressure being put on the car springs by over-crowding of passengers, it is free to rise and fall, as the case may be, and so automatically adjust itself.

The guard is so arranged as to have its lower edges just above and clear of the rails.

The guard can, if desired, be used in lieu of the ordinary brake skid or it may be used as an auxiliary thereto. For this purpose a plate or other spring may be fitted to the under side of the car and to the front or other part of the guard, in such manner, that, the guard will normally press against the car wheel and thus act as a brake. To take off the guard a wedge piece or equivalent device may be so fitted to the under side of the car that when it is pushed forward it will jamb itself between the upper end of the back part of the guard and the bottom of the car, and thus press down the back part of the guard and lift off the front part, against the action of the spring, from the car wheel.

The guards would be fitted one on each wheel of the car, and the wedge pieces, when the guard is used also as a brake, could be actuated by the driver by means of rods or in any other well known manner. Instead of having a spring and wedge piece as described, the brake can be applied by pulling the guard up against the wheel by means of a chain or rod attached to its front part.

The mould-board shape of the shield, in the event of an accident throws the person knocked down, to one side and clear of the rails. To prevent the possibility of the person being, by any chance, thrown in front of the following wheel of the car, the guard may be prolonged backward for some distance, or it may be connected by rods or metal strips with the guard of the following wheel.

If desired the guards may be made open and be fitted so as to cage in the wheels either partially or wholly.

[Price 8d.]

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In the case of wheels turning on pivots, such as the front wheels of carriages and the like, the guard would, by preference, be fitted to the axle so as to allow of the wheels turning freely.

Dated this Twenty-eighth day of August 1889.

H. D. FITZPATRICK,
70, Wellington Street, Glasgow, Applicant's Agent.

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COMPLETE SPECIFICATION.

An Improved Wheel Guard Applicable for use on Tramcars, Railway Carriages, and other Vehicles.

I, JOHN MOUNTGOMERY COLLINS, of 45 Bartholomew Street, Bridgeton, Glasgow, 10
Engineer, do hereby declare the nature of this invention and in what manner the
same is to be performed, to be particularly described and ascertained in and by the
following statement:—

In the majority of vehicles as presently constructed, no provision whatever is made
for preventing pedestrians and others, who may happen to be knocked down by the 15
vehicle, from being run over by the wheels. In some vehicles, however, very crude
and inefficient wheel guarding appliances are provided.

This invention has for its object the providing of an efficient wheel guard, for
tramcars, railway carriages and other vehicles, which will prevent, or aid in the
prevention, of the, at present, too numerous fatalities arising from persons being run 20
over by passing vehicles.

And in order that my said invention may be properly understood I have hereunto
appended two explanatory sheets of drawings, whereon

Fig. 1 shows in side elevation a tramcar with my guard appliance fitted thereto.

Fig. 2 is an underside view of the car, fig. 1.

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Fig. 3 shows part of a tramcar with guard appliance fitted thereto.

Fig. 4 is an end view of the car, fig. 3.

Fig. 5 shows, in side view, part of a car with guarding and braking appliance fitted
thereto.

Fig. 6 is an underside view of the car, fig. 5.

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Fig. 7 shows position of guard when car is ascending an incline.

Figs. 8, 9, 10, 11, 12, 13 and 14 are detail views to an enlarged scale.

Fig. 15 (sheet 2) shows, in side elevation, an engine and tender with my guard
appliance fitted thereto.

Fig. 16 is an end elevation of the engine tender, fig. 15.

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Fig. 17 is a front elevation of the locomotive, fig. 15.

Fig. 18 is a cross section, to an enlarged scale, of the frame of the tender fig. 15,
showing guard raising mechanism.

Fig. 19 is a longitudinal section of the frame, fig. 18.

Fig. 20 is a cross section of frame showing a different arrangement of mechanism 40
for raising the guards.

Fig. 21 is a longitudinal section of the frame fig. 20.

Fig. 22 is an enlarged detail view of part of the guard raising mechanism
fig. 20.

I will now proceed to describe my invention reference being had to the drawings 45
whereon the same reference letters wherever repeated indicate similar or like parts.

Referring to the figs. on sheet 1 which show my invention as applied to a tramcar,
A is the tramcar, B the wheels, C the wheel axles, A¹ are the rails. The wheel
guard consists of a, preferably, metal shield D which is shaped somewhat after the
manner of the mould board of a plough as shown. This shield D has its sharp part 50
or edge a little in front of the wheel of the car and the two sides extend backwards
for a distance sufficient to enclose the front part of the wheel as shown more
particularly at figs. 1 and 2. Inside the guard or shield at its lower part, pretty well
forward is fitted a small broad wheel or roller E, the periphery of which projects, as

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shown, a little underneath the lower edges of the guard or shield, so that it can run freely on the rail. The wheel E is or may be loosely fitted on a stud or pin F passed through the guard from side to side as shown at fig. 2. The wheel guard is, preferably, pivotted or hinged at G to a bracket I bolted or otherwise attached to the axle box H so that on the slightest inequality of the rail or on the small wheel E over riding any small obstruction or in the event of any extra pressure being put on the car springs by over-crowding of passengers it is free to rise and fall, as the case may be, and so automatically adjust itself. Instead of pivotting the shields D to the axle boxes H they may be pivotted, hinged or fitted to the axles or to any other suitable part of the car. The wheel E is fitted at such a height in the shield D. that the lower edges of the shield shall be just above and clear of the rails.

Instead of having only one guard to each wheel as hereinbefore described I may have two guards or shields D, to each wheel as shown at figs. 1, 2, 8, 9 and 10.

In figs. 3 and 4 the tramcar is shown as having its wheels B protected by means of a shield D fitted to each wheel and also by guard plates J extending across the front of the wheels so as to make it impossible for any one who had been knocked down by the horses or engine or other tractive power from passing underneath the car. As will be seen more particularly from the plan view at fig. 6 the guard plates J are bulged or bent out at their middle and slant backwards on either side, in order that persons caught thereon may be thrown outwards and free of the vehicle. The guards J are pivotted or otherwise connected at K to the shields D. Besides the shields D and guard plates J there may also be fitted to the car at both sides, a plate L for preventing the possibility of the person knocked down being by any chance thrown in front of the following wheels of the car. The guard plates L may be fitted to the axle box as shown or to the axle or to any other convenient part of the car. The plates L may have fitted in them rollers or wheels L¹.

In figs. 5, 6, 11, 12, 13 and 14 an arrangement of brake skid or shoe is shown as being used in conjunction with the guards D. The shoe M which is shown to an enlarged scale at fig. 14, has a wedge shaped end M¹ and a weighted end M². The shoe is pinned at N to the lower end of a rod or arm O which is pivotted or hinged at its upper end O¹ to a bracket N¹ on the axle box, or to other suitable part of the car. Fitted in suitable bearings O² to the bottom of the car is a shaft or rod P which has on each of its outer ends a drum or wheel P¹. Chains Q are connected to the drum P¹ and to the rods O. For actuating the brake, a brake lever R, which is connected by a chain R¹ or its equivalent to the centre or other part of the shaft P is provided. A catch is provided for keeping the lever R in its locked position. When the chains Q are connected to the drums P¹ in the manner shown, the chain R¹ is preferably connected to the underside or to the back of the shaft P in order that when the chain is pulled it will cause the shaft to turn round from right to left and so pull up the chains Q. The chains Q and R¹ may, however, be so fitted to the shaft P and drums P¹ that to pull the chains Q the drums would turn from left to right. On the car, figs. 5 and 6, brake skids are shown as fitted to each wheel. With this arrangement the brake shoes M will apply themselves by their own weight to the wheels, on the lever R being released from its catch. The lever R is shown released in figs. 5 and 6 and the brakes M are shown as applied to the wheels. The shoes M are lifted or pulled up off the wheels by the driver or guard pulling the lever R towards him, which action pulls the chain R¹ and so causes the shaft P to turn. The turning of the shaft also causes the drums P¹ on it to turn from right to left and to thus wind up or pull the chains Q and lift up the shoes M. The shoes M are kept up off the wheels so long as the lever R is retained in the catch but immediately it is released the brakes are applied.

In fig. 7 the car A is shown as going up an incline and as will be seen the guard or shield in this case rises slightly upwards from the position shown in dotted lines so as to adapt itself to the rail.

Referring to the figs. in sheet 2, which show my invention as applied to locomotives and rolling stock.

In figs. 15, 16 and 17 the invention is shown as applied to a locomotive S and

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tender S¹. The locomotive S has a guard plate J, hinged or pivotted at S² to the front of the engine frame and which extends across and covers over the front wheels. The guard plate J, is bulged out at its centre in the same manner as the guard plate, figs. 5, 6, and for the same purpose. The guard plate J, has rollers or wheels E fitted to it which run on the rails. Shields D are shown as fitted to each wheel of the tender. 5
The shields may be hinged or pivotted to brackets I, on the axle boxes or to other suitable part.

As it is not desirable, when the train is travelling at a great speed to have the wheels, E, of the guards D running on the rails, I have shown at figs. 18, 19, 20, 21 and 22 arrangements or devices for lifting the guards up off the rails. One arrangement consists as shown at figs. 18 and 19 of a centrifugal governor movement. On any one of the axles of the tender, carriage or other rolling stock but, preferably on the middle one when there are three pairs of wheels as shown, there are fitted two sliding collars T connected by rods T¹¹ to balls T which have holes in them and are free to slide in and out on the guides or arms T². The balls T¹ are prevented from flying off the arms or guides T² by the heads T³. Forked levers T⁴, pivotted at their upper ends T⁵ to the underside of the frame T⁶, catch on the collars T. Chains T⁷ connect the levers T⁴ with the hinged levers T⁸. The levers T⁸ are connected at T⁹ to the guards D. The chains T⁷ run on pulleys T¹⁰ fitted to the outside of the frame. The axles may have on them springs T¹² for forcing out the collars T, as shown. With this arrangement as the speed of the train increases the revolutions of the wheels and axle also increase, the consequence of this is that the centrifugal action throws or impels outwards the balls T¹. The impelling outwards of the balls T¹ draws the collars T, by means of the rods T¹¹ together. The coming together of the collars T draws the forked levers inwards and at the same time pulls up the chains T⁷ and hinged levers T⁸ and thus forces outwards and upwards the guards D lifting them clear of the rails. When guards are fitted to every wheel the chains T⁷, connected thereto may be actuated by means of two hanging shafts U, one fitted at each side of the frame (see fig. 19) which are swung inwards and outwards by means of a pair of forked levers T⁴ working on collars T fitted to one of the axles as shown. The shafts U, which are pivotted at each end to brackets U¹, have the forked levers T⁴ and the chains T⁷ connected to them so that the guards D on the wheels will be lifted up or let fall in unison. 20 25 30

Instead of having a centrifugal movement, as hereinbefore described, for raising the guards D they may be raised, as shown at figs. 20, 21 and 22, by means of steam or air pressure supplied from the engine. Steam or air is admitted to the upper side of the piston V in the cylinder W which is fitted to the underside of the frame. The steam or air pressure forces the piston downwards and the piston rod V¹ forces downwards the inner ends of two bell crank levers V², pivotted at V³ to arms or brackets X cast on or fitted to the cylinder W. As a consequence of the downward movement of the inner ends of the levers V² their outer ends, which have toothed segments V⁴ on them, are moved upwards through an arc of a circle having the pivots V³ as the centre. As the toothed segments V⁴ gear with toothed wheels V⁵ on the shafts U the shafts are caused to revolve. The shafts U in this case are not hanging shafts but are carried by and are free to revolve in bearings U¹¹. The chains T, as before are connected to the shafts U. As the shafts revolve or turn, the chains T⁷, are drawn or pulled up and thus lift up the guards D. With this arrangement the fluid pressure can be applied by the engine driver and the guards be lifted up or let fall at will. 35 40 45

Guard plates J, may be used with railway rolling stock if desired. 50

Instead of making the shields D and guards of metal plates they may be made of rods or bars interlaced or they may be made in the form of gratings. The guards may cover or cage in the wheels wholly, instead of partially as shown on the drawings.

My improved hinged or pivotted wheel guard whilst being simple in construction and cheap, is very efficient as it can if desired be made to adjust itself to the varying height of the body of the car from the rails, and its mould board shape, in the event 55

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of an accident, throws the person knocked down to one side and clear of the rails. When the guards are fitted to the axles they, of course, always retain their relative position to the rails so long as the bearings are in good order.

5 The guard may be fitted to omnibuses, carriages or carts, as well as tramcars and trains. In this case the wheels E, would, preferably, be made larger than those shown, and the guard would be kept a little higher off the ground.

In the case of wheels turning on pivots, such as the front wheels of carriages and the like, the guard would be fitted to the axle so as to allow of the wheels turning freely.

10 Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is :—

1. In tramcars, railway carriages and other vehicles, a wheel guard hinged or pivotted to any suitable part of the car or other vehicle and partially or wholly
15 enclosing the wheels, substantially as hereinbefore described and shown on the annexed drawings.

2. In tramcars, railway carriages and other vehicles, a wheel guard hinged or pivotted to any suitable part of the car or other vehicle and having wheels or rollers at its underside which may run on the rails, substantially as hereinbefore described and
20 shown on the drawings annexed.

3. The combination with the guards D of the hinged or pivotted side plates L and end plates J substantially as hereinbefore described and shown on the annexed drawings.

Dated this 21st day of March 1890.

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H. D. FITZPATRICK,
70, Wellington Street, Glasgow, Agent.